Radio-Frequency Identification

Technology benefits anything requiring ID or inventory

We have demonstrated the feasibility of radio-frequency identification technology for a wide range of applications in both transportation and industry. Radio-frequency identification can remotely identify vehicles, inventory, or personnel within its range without the need for individual scans — saving time and money as well as providing greater flexibility over current bar-code inventory-control systems.

Wireless interface

The system consists of two parts: a tag and a reader. Using radio-frequency waves, the reader transmits a signal to activate a tag, which is a small transceiver. The tag, in turn, transmits encoded data back to the reader, which acknowledges and logs the signal via a computer. The tag has read-write capabilities, enabling its data to be modified remotely, as necessary.

Automatic vehicle identification

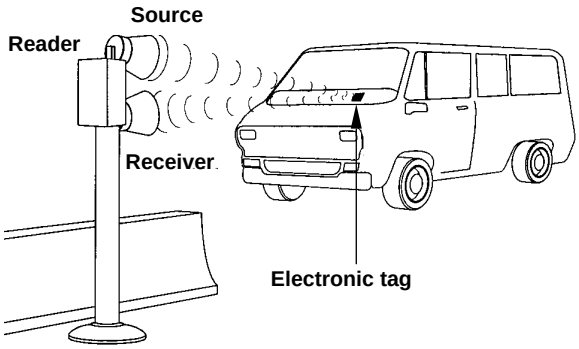
In partnership with the California Department of Transportation, we developed a prototype vehicle identification system for automating toll collections.

An electronic tag on the car identifies the vehicle. As it passes roadside equipment, a 915-MHz signal is reflected back to the reader, modulated with information from the tag. Because the system automatically debits an account to collect the toll, the vehicle can proceed without stopping. The system will be capable of assuming broader roles in the future, such as vehicle-to-roadway communication or using vehicles as traffic probes. In the latter case, the system can read the velocity of particular cars and provide information on traffic conditions.

APPLICATIONS

- *Vehicle identification*
- *Inventory*
- *Personnel identification/ location*

We are also assisting the Federal Highway Administration in developing a national vehicle-to-roadway standard for commercial vehicles. Primary application is for automatic clearance of trucks at highway speeds upstream from a weigh station. Electronic credentials, safety sensors status, and other information would be transmitted from the on-vehicle tag. In-transit data and driver messages would be transmitted from the infrastructure.



A vehicle identification system was devised for the California Department of Transportation to automate toll collection.

Inventory control and personnel identification

Radio-frequency identification has a number of other wide-ranging applications. Robots can be fitted with readers to inventory warehouses quickly and economically. Machinery and vehicles can be fitted with tags containing maintenance data. Badges can be fitted with tags for locating personnel. Tags and readers can even be used to identify casino gaming chips. In other words, anything requiring identification or inventory can benefit from this technology.

Availability: The technology for radio-frequency identification is available now. Research and prototypes are tailored to meet specific requirements of collaborators.

Contact

Don Davis
Phone: (510) 422-8801
Fax: (510) 423-9649
E-mail: davis14@llnl.gov
Mail code: L-644